

The Cost of Highway Maintenance

Importance of Road Maintenance Where Highways Are Built With Borrowed Money.

Washington, D. C.—That highways constructed with borrowed money should be strictly maintained, is the keynote of a chapter in Department of Agriculture bulletin No. 136, dealing with highway bonds. It has not been customary for officials to face frankly the cost of the maintenance and repair of bond-built highways at the time the bonds are issued and before construction begins. In fact, the authors of the bulletin point out, in the majority of cases where bonds have been issued by local authorities there has been no provision whatever for maintaining the roads when built. This is perhaps the greatest defect in the method of building highways by issuing bonds.

Maintenance, the highway experts of the department point out, is necessary in order to insure to the community the maximum economic service by the road, and also to preserve the investment. The cost of maintenance and repairs must, therefore, be studied at the outset. In the absence

of general data, the reports on maintenance from states, which have highway departments should be of interest to county officers preparing to issue road building bonds.

The following opinions as to maintenance cost represent the results of careful analysis of state highway reports, as well as much first-hand information gathered by the department's specialists:

Well-constructed gravel roads will sometimes sustain several years of traffic without showing marked deterioration, even when there has been no maintenance. Such roads sometimes even improve during the second season, more frequently, however, they show ruts or the formation of chuck holes. It can not be expected that the average life of a gravel surface will be greater than that of a macadam surface. The average interval for resurfacing macadam roads is between six and seven years. If a sum equal to two-thirds of the original cost of the gravel surface itself is provided for renewals at six-year intervals, it should be estimated at from \$150 to \$250 per mile per year. If \$30 is then allowed for annual dragging and small repairs, the total annual cost of repair and maintenance of gravel roads would be from \$180 to \$280 per mile. The annual cost of strict maintenance is sometimes below \$30. In Bennington county, Vermont, during 1912, 175 miles of gravel roads were maintained at a cost of \$20.70 per mile. The annual cost of maintenance and repair on sand-clay roads, including all necessary resurfacing at periodic intervals, should not be fixed at less than 10 per cent of the original cost.

The cost of repair and maintenance of water-bound macadam roads has been determined with considerable exactness from Massachusetts figures and checked by resurfacing charges in other states and in Germany. From \$100 to \$125 per year ordinarily pays for necessary small repairs, such as patching, cleaning culverts, etc., and from \$400 to \$425 per year is the necessary annual charge for resurfacing at periods varying from six to seven years. The sum of \$525 per mile on an average should therefore absolutely maintain macadam roads if changes and increases of traffic are not excessive. It must be understood, however, that in many instances where macadam sufficed for the volume and character of traffic prior to 1906, it will not withstand the action of the motor vehicle traffic, which has developed since that time.

Many miles of ordinary or water-bound macadam road have been resurfaced with bituminous materials and many miles of new bituminous-macadam road have been constructed. The logical maintenance of such highways is a surface treatment with bituminous material and rock screenings, clean gravel, or sharp sand. The cost of such surface treatment is from 4 to 12 cents per square yard, and it may be expected to last from one to three years, according to the density of traffic and the success of the application. Theoretically, perfect surface treatment would constitute absolute maintenance for a bituminous-macadam road. Such maintenance is seldom or never realized and bituminous-macadam roads doubtless require resurfacing at intervals. The cost of such resurfacing is not yet known.

The average cost for repair and maintenance of 7,300 miles of highway in Connecticut, Massachusetts, New York, New Jersey and Rhode Island for the year 1912 was about \$800 per mile. A large part of this money was expended for bituminous resurfacing and bituminous surface treatment. There is some question whether the expenditure correctly measures the average cost of repairing and maintaining bituminous-macadam roads. In the state of New York, however, for the years 1911 and 1912 the average cost for repair and maintenance was \$724 per mile upon a total average of 2,861 miles. The annual cost of repair and maintenance on Massachusetts state roads for the years 1910, 1911 and 1912 was, respectively, \$642, \$647, and \$676 per mile for about 850 miles. For the most part these figures for New York and Massachusetts represent the cost per mile of resurfacing with bituminous material and of maintaining bituminous-macadam and water-bound macadam roads by surface treatment with bituminous material. It is clear, therefore, that \$700 per mile is not an excessive estimate at present for the annual cost of all repair and maintenance of bituminous-macadam roads.

Light Weights, Heavy Weights and Saps

State Food Commissioner Helme Offers His Advice From Investigations Made.

Lansing—Dr. Lewis Baker of Ohio has joined the Mae Martin class in Michigan and through advertisements in the leading dailies is answering all correspondents, mythical and otherwise, with remedies for most of the diseases that human flesh is heir to.

In a recent ad "Kit" writes she is in danger of qualifying for a place in a side show as a living skeleton and becoming a real kitten and she suffers from headaches.

The doctor advises a "Cough course of Hyponuclease Tablets." Our chemist has examined Hyponuclease Tablets and was unable to identify any active drug or drug principles.

These tablets when placed in a 3% solution of Hydrochloric Acid (which is the natural acid of the stomach) required over 96 hours to dissolve. It looks like "Kit" might trade off her headaches for stomach aches. Ninety cents is the price of sixty three-grain tablets.

"Miss T. R." is evidently afraid she may qualify as the fat woman in the side-show. She confesses to the modest weight of 190 pounds and still gaining. She wants the Doctor to carve, medically, 30 pounds from her robust form. The doctor advises the regular use of 5-grain Arbolene Tablets. Analysis of these tablets show that the active principles is the Thyroid Gland of the sheep. The National Dispensary says that Thyroid Gland when used in quantities sufficient to cause decrease in weight often causes ill health, changes the skin to a sallow hue and also causes wrinkling of the skin. If "Miss T. R." wishes to swap her 30 pounds of healthy flesh for a skin like a Chinaman and wrinkles like a Merino sheep thyroid gland will probably have a tendency to produce that result. But just take it from us, "Miss T. R." that if you wish to reduce flesh, just stop eating. Any Arctic explorer can give testimonials to that effect.

"Maud" has got a real affliction in a bad case of catarrh. Her nose runs and her breath smells until she is obliged to eschew all osculatory performances with any gentleman callers. But the Doctor has the stuff for "Maud," the afflicted. All she has to do is to dissolve half a teaspoon of Villane powder in a pint of warm water two or three times a day and "Presto Change," back comes health and suitors and the pocket handkerchief can be used for a napkin.

Our chemist says that Villane powders on examination were found to be composed of common salt 40%, baking soda 35%, Borax 15% and Salicylate of Soda 10%. Selling price 50 cents. Estimated cost 2 cents. Mix your own dope, "Maud," and for 50 cents you will have a barrel full of solution, enough to cure all the running noses in an average sized village—provided it works.

GOVERNOR FERRIS NAMES DELEGATES

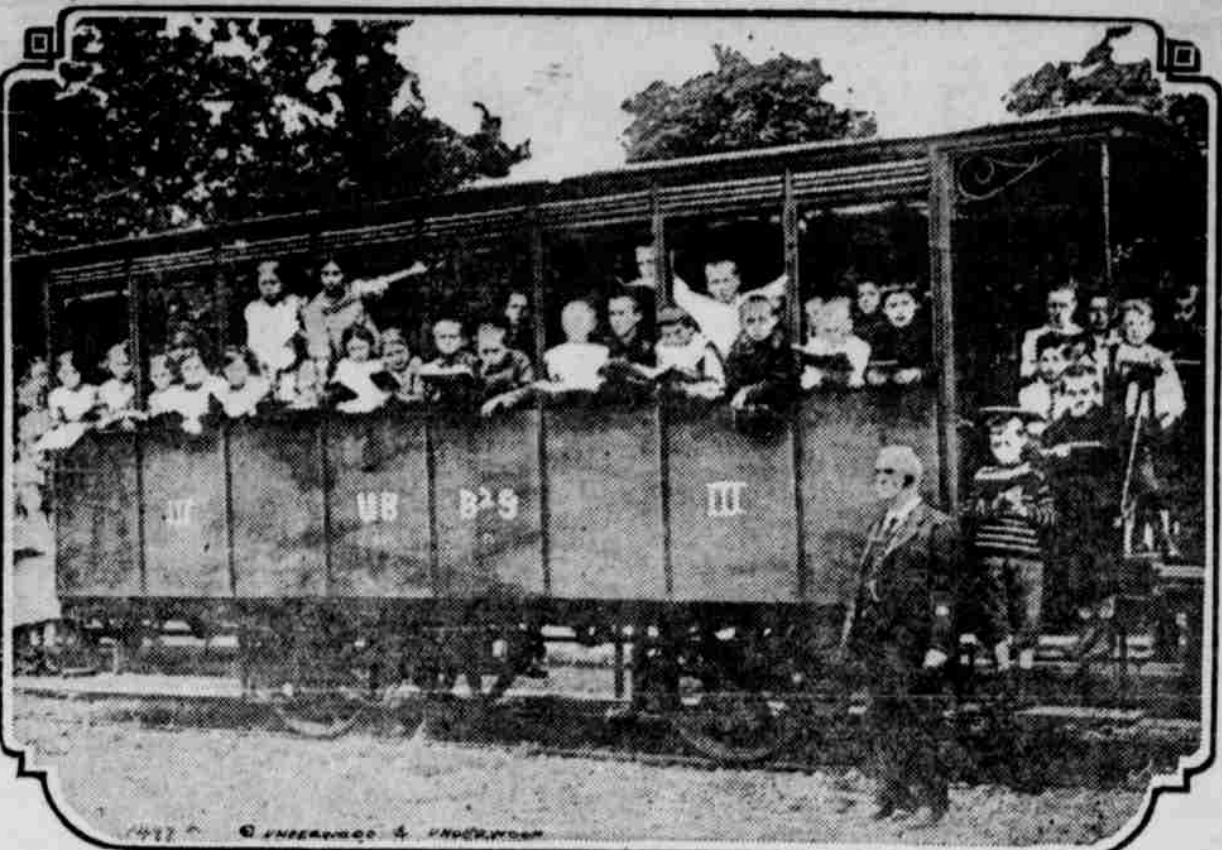
Lansing—Governor Ferris appointed the following delegates to the eleventh annual conference of the National Child Labor commission at Washington, January 5 and 6. Judson Grennell, Waterford; C. S. Beadle, Detroit; President Samuel Dickey, Albion; Tracy N. McGregory, Detroit; Ira W. Jayne, Detroit; Jesse B. Davis, Grand Rapids; Rt. Rev. J. N. McCormick, Grand Rapids; Fred A. Zierleyn, Grand Rapids; Miss Luella Burton, Lansing; Mrs. E. J. Cornwell, Saginaw; Miss Kate Carlisle, Saginaw.

PAYS BIG FEE TO STATE.

The Merger of New York Central and Lake Shore and Michigan Southern Pays \$150,000.50 in Treasury.

Lansing—The New York Central Railroad company paid into the state treasury \$150,000.50 on the authorized capital stock of \$300,000,000. The \$150,000 was for the articles allowing the merger with the Lake Shore and Michigan Southern road and the 50 cents was for filing the papers.

TRAINS TURNED INTO SCHOOLS FOR GERMAN CHILDREN



CURRENT EVENTS

By Paul Leake

British trade statistics show that a drop in British trade during four months of the war was \$581,659,730.

The disbursements of dividends and interest on stocks and bonds listed on the New York stock exchange for January will amount to \$241,333,803.

Emperor Francis Joseph of Austria has conferred the Red Cross of Merit on American Ambassador Penfield, Rear Admiral Ward U. S. A., and Dr. Van Dyke, minister to the Netherlands.

The sub-committee of commerce in congress will add \$500,000 to the rivers and harbors bill, making the total above \$40,000,000.

Immigration at the port of New York is now only about 20% of normal and is composed chiefly of Italians, Scandinavians and Irishmen.

The cattle quarantine from foot and mouth disease has been lifted from ten of the 21 counties of New Jersey.

The British embargo on hides imported from Australia and New Zealand will be lifted early in January.

Reindeer meat from Iceland has found its way to the markets of Berlin.

A New York bride has offered a reward for the return of \$50,000 worth of jewels lost from her new home at Hollis, Long Island.

Eugene Zimmerman, father-in-law of the Duke of Manchester and well known as the man who got the Pere Marquette railroad company into a financial tangle, recently died suddenly at a Cincinnati club.

All national bank examiners have been put upon a salary and the fee system has been abolished.

A New York dealer estimates that between the hen and the consumer there is an annual waste in eggs of \$200,000,000 a year, due to breakage and decay.

A run from Missouri recently made himself conspicuous at Washington, D. C., by declaring he had been chosen to wed Margaret Wilson, the daughter of the president, or Miss Mary Watson, daughter of the congressman of that name from Georgia. He did not seem to care which. He is confined in a hospital pending an examination as to his sanity.

Attorney General Gregory of the United States has given an opinion that the federal reserve banking board is independent of the secretary of the treasury except where special authority is conferred upon the secretary by law.

John D. Rockefeller has asked an injunction in Cleveland, Ohio, restraining the county treasurer from collecting taxes on \$311,047,337 assessment by the county tax commission.

Wholesale prices on carpets will be advanced from two to five cents a yard early in January.

Rome dispatches say that King Victor of Italy will appoint Marconi, the wireless telegraphy inventor a senator.

Stock yard and government experts Nice, Mentone, Monaco and Monte Carlo, taking census of cattle in the United States estimate the visible supply at less than 35,000,000, and that meat at 50 cents a pound and shoes at \$10 a pair are possibilities of the next two years.

The Michigan State Company of Detroit has decided to loan money without interest to employees of one year standing who have been laid off, the loans to be repaid when the men return to work.

Herman Fusch, formerly chief chemist of the Standard Oil Company, who recently died in Paris, left an estate valued at \$5,560,573.

New York financiers have financed the cotton crop to the amount of \$75,000,000.

Property of 350 German firms in Chicago, taking census of cattle in Carlo have been sequestered by the French government to be held until after the war.

At the annual meeting of the Massachusetts state board of trade the statement was made that \$100,000,000 of capital had been removed from the state to escape "the worst system of taxation in the country."

Booker T. Washington is quoted as saying the south is facing the greatest crisis since the civil war on account of the depression in cotton.

American relief already distributed in Belgium amounts to more than \$10,000,000.

George E. Hayes, a geologist of London, predicts that Alberta, Canada, will be one of the greatest oil producing districts in the world.

John D. Rockefeller has distributed among the universities of the United States the sum of \$10,000,000.

The United States government is arranging to promote extension experiments in the breeding of fur bearing animals during 1915.

Three hundred and eighty-four herd of cattle and swine valued at \$991,000, have been slaughtered in Illinois in the war on foot and mouth disease.

Fifteen butter and egg firms in New York virtually control the prices of these commodities in the United States.

John Katz of Hammond, Indiana, when arrested on a charge of stealing chickens, said he had lost his gloves and grabbed the chickens in order to warm his hands under their wings.

A filing fee of \$300,000 was paid at Indianapolis when the papers consolidating the New York Central and Lake Shore railroads. The capitalization is \$300,000,000.

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FRENCH OFFICERS TAKE DINNER WITH A GERMAN PRISONER



This photo, taken on the road from the Argonne battlefield shows a group of interested spectators gathered about French officers of the ambulance division who are dining with a German Red Cross member who has fallen into their hands. The Red Cross ambulance is seen at the left.

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